

Gas infrastructure - Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations - Part 2: Detailed functional requirements for commissioning, operation and maintenance

Gasversorgungssysteme - Gas-Leitungsanlagen mit einem Betriebsdruck größer 0.5 bar für industrielle Installationen und größer 5 bar für industrielle und nicht-industrielle Installationen - Teil 2: Detaillierte funktionale Anforderungen an Inbetriebnahme, Betrieb und Instandhaltung

Alimentation en gaz - Tuyauteries sous pression de service supérieure à 0,5 bar pour installations industrielles et supérieures à 5 bar pour les installations industrielles et non industrielles - Partie 2: Exigences fonctionnelles détaillées pour la mise en service, l'exploitation et la maintenance

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Gas infrastructure - Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations - Part 2: Detailed functional requirements for commissioning, operation and maintenance

Systèmes d'alimentation en gaz - Canalisations d'installation de gaz avec une pression de service supérieure à 0,5 bar pour les installations industrielles et supérieure à 5 bar pour les installations industrielles et non industrielles - Partie 2: Exigences fonctionnelles détaillées pour la mise en service, l'exploitation et la maintenance

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This European Standard was approved by CEN on 11 October 2008.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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## Foreword

This document (EN 15001-2:2008) has been prepared by Technical Committee CEN/TC 234 "Gas supply", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

There is a complete suite of functional standards prepared by CEN/TC 234 "Gas infrastructure" to cover all parts of the gas supply system from the input of gas to the transmission system up to the inlet connection of the gas appliances, whether for domestic, commercial or industrial purposes.

In preparing this standard, a basic understanding of gas supply by the user has been assumed.

In the event of conflicts in terms of more restrictive requirements in national legislation/regulation with the requirements of this standard, national legislation/regulation takes precedence as illustrated in CEN /TR 13737.

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NOTE CEN/TR 13737 contains: [\(standards.iteh.ai\)](https://standards.iteh.ai/)

- clarification of relevant legislation/regulations applicable in a country;
- if appropriate, more restrictive national requirements;
- national contact point for the latest information: [EN 15001-2:2009](https://standards.iteh.ai/)

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Gas supply systems are complex and the importance on safety of their construction and use has led to the development of very detailed codes of practice and operating manuals in the member countries. These detailed statements embrace recognised standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**EN 15001-2:2008 (E)****1 Scope**

This European Standard specifies detailed functional requirements for the commissioning, operation and maintenance of

- industrial gas installations and assemblies with an operating pressure greater than 0,5 bar and of
- non-industrial gas installations (residential and commercial) with an operating pressure greater than 5 bar,

starting from the outlet of the network operator's point of delivery up to the inlet connection to the gas appliance; normally the inlet isolation valve. This European Standard also covers the inlet connection to the gas appliance comprising of the pipework that does not fall within the scope of the appliance standard.

This standard applies to gas installations operating at ambient temperatures between  $-20\text{ }^{\circ}\text{C}$  and  $40\text{ }^{\circ}\text{C}$  and operating pressures up to and including 60 bar. For operating conditions outside these limitations, reference should additionally be made to EN 13480 for metallic pipework.

For industrial gas installations up to and including 0,5 bar and for non-industrial (residential and commercial) gas installations up to and including 5 bar EN 1775 applies.

For gas installations that do not fall within the scope of EN 1775 or other European Standards, this European Standard applies.

In this European Standard, the term "gas" refers to combustible gases, which are gaseous at  $15\text{ }^{\circ}\text{C}$  and 1 013 mbar absolute atmospheric pressure. These gases are commonly referred to as manufactured gas, natural gas or Liquefied Petroleum Gas (LPG). They are also referred to as first, second or third family gases (see table 1 of EN 437:2003).

LPG storage vessels (including all ancillaries fitted directly to storage vessels) are excluded. Also excluded are LPG installations and sections of LPG installations operating at vapour pressure (e.g. between the storage vessel and its pressure regulator).

In this European Standard, all pressures are gauge pressures unless otherwise stated.

For gas installations within the scope of this standard, national legislation and regulations have to be taken into account.

Functional requirements for design, selection of materials, construction, inspection and testing of industrial gas installations and assemblies with an operating pressure greater than 0,5 bar and of gas installations greater than 5 bar in buildings and areas intended for residential, commercial, public and mixed uses are described in prEN 15001-1.

**2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12954, *Cathodic protection of buried or immersed metallic structures — General principles and application for pipelines*

prEN 15001-1, *Gas installation pipework with an OP greater than 05 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations — Part 1: Detailed functional requirements for design, materials, construction, inspection and testing*

EN 60079-10, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas (IEC 60079-10:2002)*

EN 60079-14, *Electrical apparatus for explosive gas atmospheres — Part 14: Electrical installations in hazardous areas (other than mines) (IEC 60079-14:2002)*

EN 60079-17, *Explosive atmospheres — Part 17: Electrical installations inspection and maintenance (IEC 60079-17:2007)*

EN 60079-29-1, *Explosive atmospheres — Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases (IEC 60079-21-1:2007, modified)*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1 Definitions relating to pressure

##### 3.1.1

##### **pressure**

gauge pressure of the fluid inside the system, measured in static conditions

##### 3.1.2

##### **design pressure (DP)**

pressure at which the design calculations are based; this is equivalent to the maximum allowable pressure (PS) as given in the PED

##### 3.1.3

##### **operating pressure (OP)**

pressure which occurs within pipework under normal operating conditions

##### 3.1.4

##### **maximum incidental pressure (MIP)**

maximum pressure which pipework can experience during a short time, limited by the safety devices

#### 3.2 Definitions relating to the gas installation

##### 3.2.1

##### **pipework**

assembly of pipes and fittings

##### 3.2.2

##### **components**

any item from which a gas supply system or installation is constructed. A distinction is drawn between the following groups of components:

- ancillaries (for example pressure regulators, valves, safety devices, expansion joints, and insulating joints);
- pipes, including bends made from pipe;
- instrumentation pipework;
- fittings (for example reducers, tees, factory-made elbows, flanges, dome ends, welding stubs, and mechanical joints)

**EN 15001-2:2008 (E)****3.2.3****point of delivery**

point where the gas is transferred to the user.

NOTE This can be at a means of isolation or at the meter outlet connection and is normally at the point of transfer of ownership.

**3.2.4****user(s)**

person(s) responsible for the safety of the gas installation and associated risks on a site

NOTE Normally the user will be the site occupier or owner. It should be assumed that every user has a responsibility for work performed on their site, whether or not the work is performed directly for the user or not. This does not mean that they cannot take advice from an independent specialist.

**3.2.5****installation pipework**

pipework including components and stations downstream of the point of delivery terminating at the appliance inlet connection

NOTE This pipework is normally the property of the customer

**3.2.6****ventilated space**

space where the air is continuously changed by natural or mechanical means

**3.2.7****duct**

space specifically designed and constructed for the passage of building services

EXAMPLE Building services include gas pipework, [water systems, power](https://standards.iteh.ai/catalog/standards/sist/bb59f4e9-457a-40c2-a6ee-8c2d0d0a1261/sist-en-15001-2-2009) and telecommunication cables

**3.2.8****ventilation duct**

duct forming part of the structure of the building and intended exclusively for ventilation purposes

**3.3 Definitions relating to means of isolation****3.3.1****means of isolation**

device that is intended to interrupt the gas flow in pipework

EXAMPLE a manually operable valve

**3.4 Definitions relating to components****3.4.1****regulator**

device which reduces the gas pressure to a set value and maintains it within prescribed limits

**3.4.2****insulating joint**

fitting installed to insulate electrically one section of pipework from another

**3.4.3****sleeve**

protective pipe through which a gas pipe passes

**3.4.4****vent pipe**

pipework connected to a safety or control device to release gas at a safe location

**3.4.5****creep relief valve**

device designed to release a limited flow of gas in the event of an unacceptable pressure being detected within the system it protects

**3.4.6****instrumentation pipework**

pipework required for the proper functioning of the ancillaries installed within the pressure regulating installation

EXAMPLES Sensing, measuring, auxiliary and sampling lines

**3.5 Definitions relating to tests****3.5.1****strength test**

specific procedure intended to verify that the pipework meets the requirements for mechanical strength

**3.5.2****tightness test**

specific procedure intended to verify that the pipework meets the requirements for tightness

**3.5.3****leak detection fluid**

specially formulated fluid and foaming product that gives a clear indication that a leak exists when applied to an element of pipework

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**3.6 Definitions relating to commissioning, operation and maintenance****3.6.1****admission of gas**

operation of replacing the air or inert gas contained in pipework with distributed gas

**3.6.2****purging from gas**

operation of replacing the distributed gas in pipework with air or inert gas

**3.6.3****purging**

process for safety removing air or inert gas from pipework and/or pipeline components and replacing it with gas, or the reverse process. A distinction is made between the following methods:

- direct purging: the displacement of air by gas or vice versa;
- indirect purging: the displacement of air by inert gas followed by the displacement by gas or vice versa: alternatively by means of a barrier (a slug of inert gas or a pig) between the air and the gas or vice versa

**3.6.4****commissioning**

activities required to fill and to pressurise pipework, stations, equipment and assemblies with gas and to put them into operation

**EN 15001-2:2008 (E)****3.6.5****decommissioning**

activities required to take out of service any pipework, stations, equipment and assemblies filled with gas and to disconnect them from the rest of the system

**3.6.6****competent person**

person who is trained, experienced and approved to perform activities relating to gas pipework

NOTE Means of approval are determined within each country

**3.6.7****hot tapping**

procedure involving the safe use of heat, e.g. welding or fusion, to affix an attachment to a section of pipework containing gas at pressure

**3.6.8****hot work**

work that can provide an ignition source.

**3.7 Definitions relating to pressure regulating and metering****3.7.1****gas pressure regulating and metering system**

system comprising all equipment, together with inlet and outlet piping up to and including the isolating valves, which together performs the functions of pressure regulation, pressure safety and/or quantitative gas measurement, whether or not including pressure boosting and/or gas mixing facilities

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**4 General**

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**4.1 Technical file**

prEN 15001-1 requires that sufficient written information concerning the system design, construction, examination, operation and maintenance is recorded in a technical file/operating manual. Any changes to the system that affect the information contained in the technical file shall be recorded in the technical file.

The technical file can contain the following information, which shall be updated at the completion of commissioning to record any changes made:

- a) Diagram of the installation pipework and pressure regulation installations;
- b) Details of design standards used, evidence of testing of materials and components together with any Certificates issued by test bodies/manufacturers;
- c) Design pressures and temperatures, maximum and minimum;
- d) Flow rates and discharge capacities;
- e) Function and duty of protective controls;
- f) Corrosion allowances;
- g) Material wall thickness of pipes;
- h) Materials of construction;
- i) Welding standards and test procedures;

- j) Commissioning procedure;
- k) Testing and re-testing procedures;
- l) Purging procedures or methodology;
- m) Setting of pressure regulators and safety devices;
- n) Operating manual including decommissioning and maintenance procedures including in-service inspections;
- o) Changes made during the commissioning procedure.

## 4.2 Changes affecting an existing installation

Alterations or modifications to the installation including electrical equipment that changes its original characteristics, purpose and/or type, shall be carried out in accordance with prEN 15001-1.

## 4.3 Quality system

The life of a gas installation can be divided into three phases:

- Design (see prEN 15001-1);
- Construction and testing (see prEN 15001-1);
- Operation and maintenance.

A quality system shall be applied to the operation and maintenance activities in accordance with this European Standard.

Reference may be made to EN ISO 9000 or to equivalent quality systems.

After the gas installation has been commissioned, a precisely defined programme of operation, maintenance and condition monitoring should maintain the integrity of the pipework.

## 4.4 Protection against hazards

### 4.4.1 Electrical installation in hazardous area

When an area has been classified as hazardous (see EN 60079-10) subsequent electrical installations shall comply with the EN 60079-14.

NOTE See Directive 1999/92/EC of the European Parliament and of the council of 16. December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15<sup>th</sup> individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC). All mechanical and electrical equipment will need to conform with 94/9/EC ATEX when within the scope of this directive.

### 4.4.2 Gas detection systems

Pipework designed and constructed to prEN 15001-1 and maintained to this standard is presumed to be tight. As such, the fitting of gas detection is not generally necessary.

However, where gas detection systems are installed,

- they shall not be considered as an alternative to ventilation,